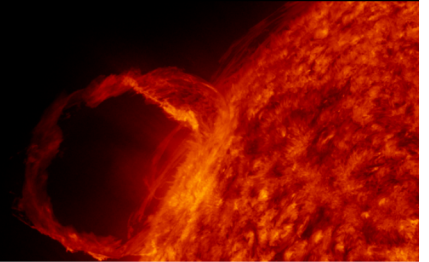


NASA's Living With a Star
Program Analysis Group
2020 Agenda

i NASA Living with a Star Program Analysis Group



LPAG Purpose:

The NASA Living with a Star (LWS) Program Analysis Group (LPAG) serves as a community-based interdisciplinary forum for soliciting and coordinating community input for Living with a Star objectives and for examining the implications of these inputs for architecture planning, activity prioritization and future exploration.

LWS Program Ex Officio:

Jeff Morrill, *NASA HQ*

Simon Plunkett, *NASA HQ*

Madhulika Guhathakurta, *NASA HQ*

Shing Fung, *NASA GSFC*

Executive Committee (EC) Co-Chairs:

Anthea Coster, *MIT Haystack Observatory*

Sabrina Savage, *NASA MSFC*

EC Members:

Joe Borovsky, *Space Science Institute*

Richard Collins, *University of Alaska-Fairbanks*

Seebany Datta-Barua, *Illinois Institute of Technology*

Heather Elliott, *Southwest Research Institute*

Matina Gkioulidou, *JHU APL*

Fan Guo, *Los Alamos National Laboratory*

Brian Walsh, *Boston University*

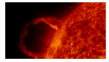
Chuanfei Dong, *PPPL Princeton University*

Angelos Vourlidas, *JHU APL*

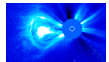
Shasha Zou, *University of Michigan*

ii

Outline



- i. Main Function of the LWS Program in 2020 was to compile a list of FSTs for 2021 and on.



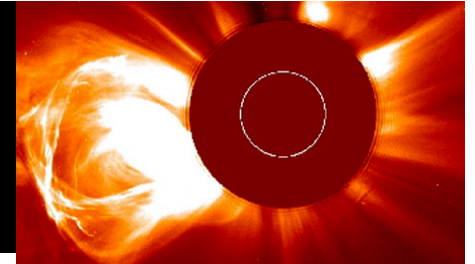
- ii. Three on-line LPAG meetings focused primarily on soliciting input for FSTs
 - 1) First meeting: community involvement, newsletters, town halls
 - 2) Second meeting: initial drafts of FSTs written
 - 3) Third meeting: Draft FSTs finalized and comments requested from community.



- iii. Some Discussion on Jack Eddy Post Docs, Summer Schools, LWS Institutes, and the LWS Program

iii

Focused Science Topics



FSTs are one of the major ways the community can influence NASA research topics.

The topics we are soliciting now will contribute to the ideas used by NASA HQ for 2+ years to craft the final ROSES LWS solicitations.

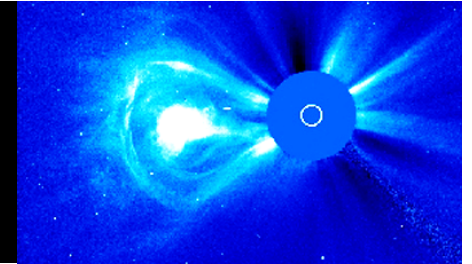
In October 2018*, the LPAG EC finalized **20** Focused Science Topics topic write-ups:

- 8 of these FSTs have been used to construct the ROSES 2019 and 2020 calls.
- 12 potential FSTs remain, and we solicit your comments on these remaining topics.
- For 2020, the primary focus of the LPAG EC is to solicit input for the development of an updated set of draft FSTs.

➤ **New FSTs will be used for ROSES 2021 and beyond.**

iv

2019/2020 Selected FSTs



2019:

- The Variable Radiation Environment in the Dynamical Solar and Heliospheric System
- Fast Reconnection Onset
- Magnetospheric and Ionospheric Processes Responsible for Rapid Geomagnetic Changes
- Causes and Consequences of Hemispherical Asymmetries in the Magnetosphere – Ionosphere – Thermosphere System

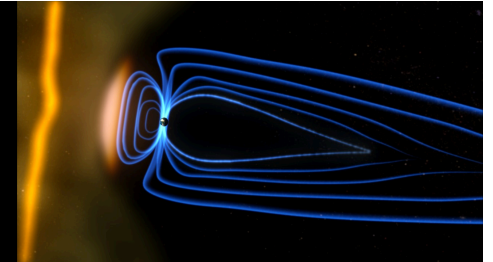
2020:

- Modeling and Validation of Ionospheric Irregularities and Scintillations
- Understanding and Predicting Radiation Belt Loss in the Coupled Magnetosphere
- The Origin and Consequences of Suprathermal Particles that Seed Solar Energetic Particles
- Long Term Variability and Predictability of the Sun-Climate System

V

New FST Community Input Solicitation

Due Date: July 3, 2020

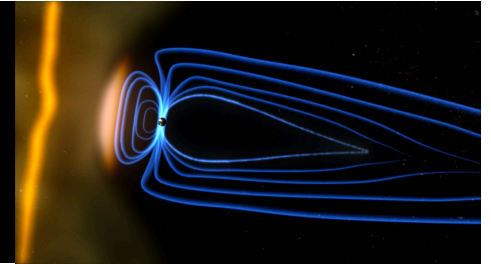


This call was used to solicit new FST topics.

The LPAG EC is soliciting community input to aid in the development of the next cycle of FSTs that will feed into the LWS ROSES science calls for 2021 and beyond.

- Suggested science topics should be organized around achieving the goals set out in the recently revised Strategic Science Areas* (SSAs).
- Enter **new FST suggestions** via <https://lwstrt.gsfc.nasa.gov/communityinput/input/>.
- View and Comment on **new and rollover FST community input** via <https://lwstrt.gsfc.nasa.gov/communityinput/viewinput/2020/>.
 - Community input regarding updates to the rollover topics as well as the newly suggested topics is welcome through this View Input and Comment page.

vi Comments on New Draft FSTs Community Input Solicitation ***Due Date: Oct 23, 2020***



This call was used to solicit comments on new drafted FSTs.

Final input on these crafted FSTs by Oct 23, 2020.

No new FST topics will be accepted, however the current FSTs may be expanded, enhanced, or modified as needed.

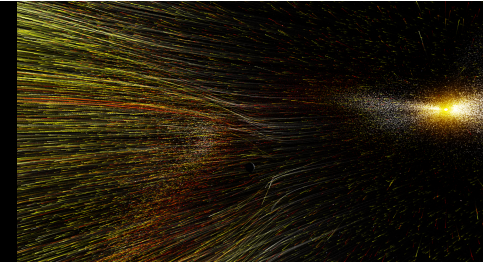
Comments are welcome and will become part of the final record.

Enter comments on the new FSTs by using the following link (on or before Oct 23, 2020):

<http://lwstrt.gsfc.nasa.gov/communityinput/DraftTopicsForComments/2021/>

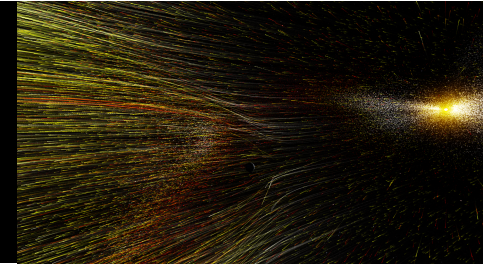
23 comments received and all addressed in final FSTs.

New 2020 FSTs (22)



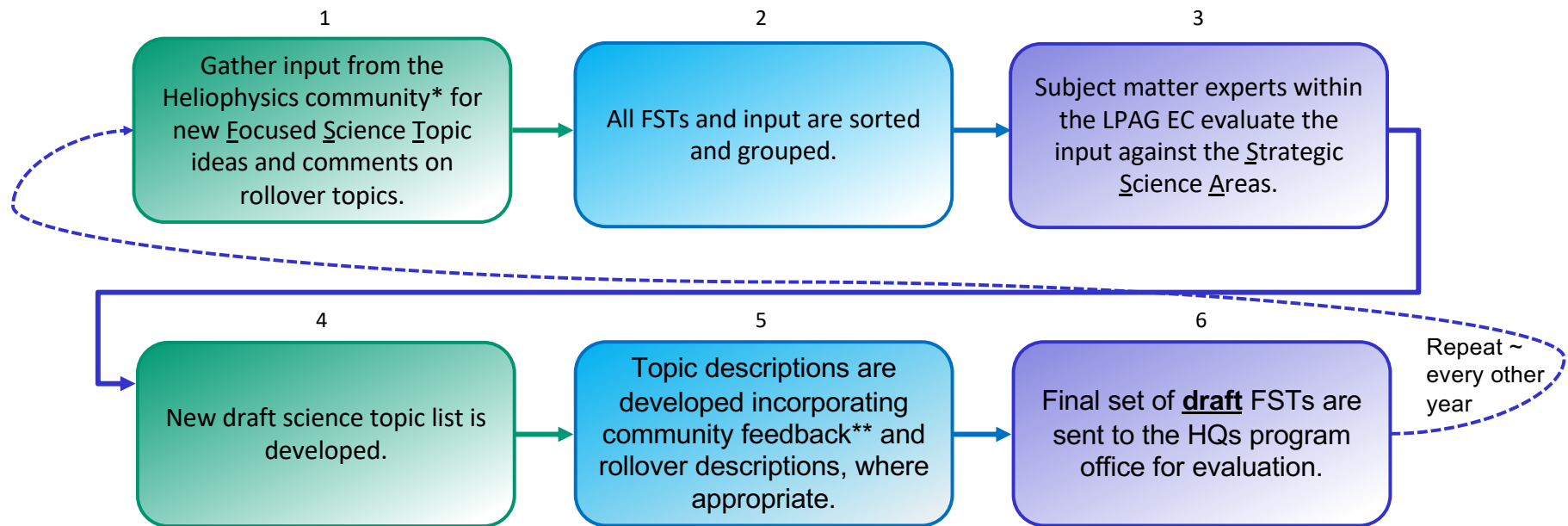
- FST 1. Connecting Space Weather and Thermospheric Composition**
- FST 2. Impact of Terrestrial Weather on the Ionosphere-Thermosphere**
- FST 3. Multi-scale High-Latitude Forcing on Ionosphere-Thermosphere System**
- FST 4. Understanding Ionospheric Conductivity and Its Variability**
- FST 5. Beyond F10.7: Quantifying Solar EUV Flux and Its Impact on the Ionosphere-Thermosphere-Mesosphere System**
- FST 6. Solar Eclipses as a Naturally Occurring Ionosphere-Thermosphere Laboratory**
- FST 7. Ion-Neutral Coupling in the Ionosphere-Thermosphere system**
- FST 8. Pathways of Cold Plasma through the Magnetosphere Pathways of Cold Plasma through the Magnetosphere**
- FST 9. Connecting Auroral Phenomena with Magnetospheric Phenomena**
- FST 10. Coupling of the Solar Wind Plasma and Energy to the Geospace System**
- FST 11. Synergistic View of the Global Magnetosphere**

New 2020 FSTs (22)



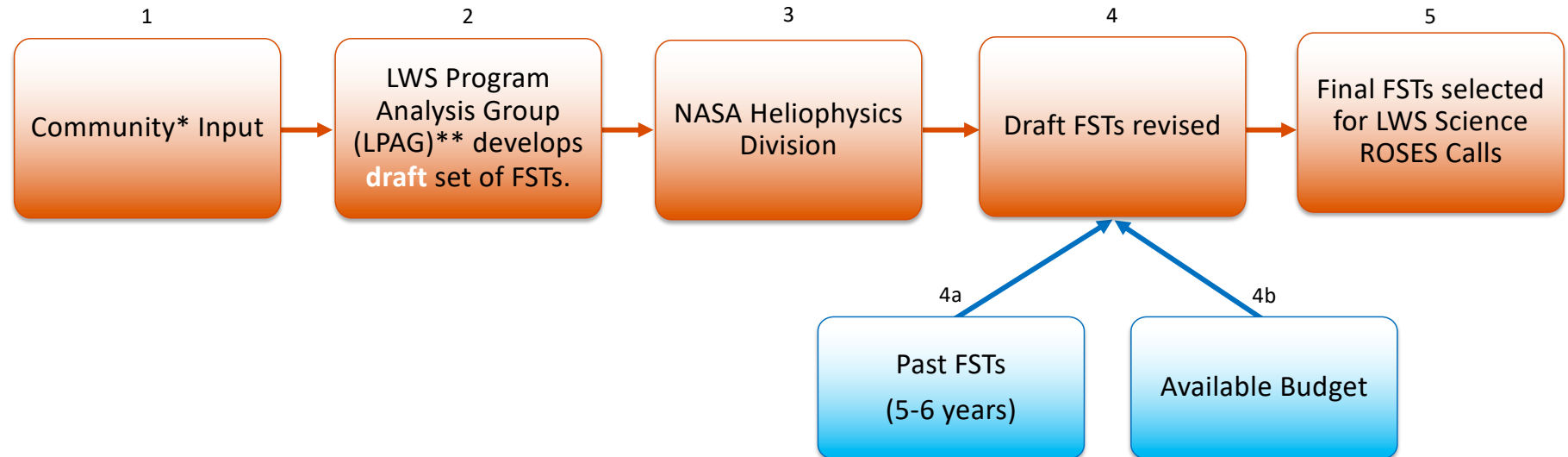
- FST 12. Understanding Space Weather Effects and Developing Mitigation Strategies for Human Deep Space Flight**
- FST 13. Evolution of Coronal Mass Ejections in the Corona and Inner Heliosphere**
- FST 14. Physical Processes Responsible for the Birth and Evolution of the Solar Wind**
- FST 15. Understanding the Large-Scale Evolution of the Solar Wind throughout the Heliosphere through the Solar Cycle**
- FST 16. Solar Flare Energetic Particles and Their Effects in Large Solar Energetic Particle Events**
- FST 17. Understanding the Transport Processes of Solar Energetic Particles from Their Origins to the Entire Inner Heliosphere**
- FST 18. Extreme Solar Events --- Probabilistic Forecasting and Physical Understanding**
- FST 19. Towards a Quantitative Description of the Magnetic Origins of the Corona and Inner Heliosphere**
- FST 20. Understand Energy Partition and Energy Release Processes in Eruptive Events**
- FST 21. Atmospheric Evolution and Loss to Space in the Presence of a Star**
- FST 22. Stellar Impact and Extreme Activity on Exoplanetary Atmospheric Loss and Habitability**

LPAG EC FST Development Process



X

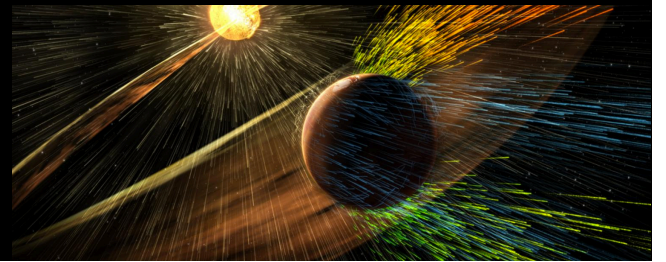
Incorporation of FSTs into ROSES



*Community are LPAG members.

**Acts as Executive Committee. Refer to previous slide.

xii ***Future Opportunities to serve
on LPAG***



Keep your eyes open.